

Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P382829

Luminaire Tested: **GLEON-SA2A-735-U-SL2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P382829  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-20)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA2A-735-U-SL2  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(2) 70 CRI, 3500K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL  
LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8701.6 lumens  
Efficiency: N/A  
Efficacy: 131.8 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B2 - U0 - G3

Input Watts (W): 66  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

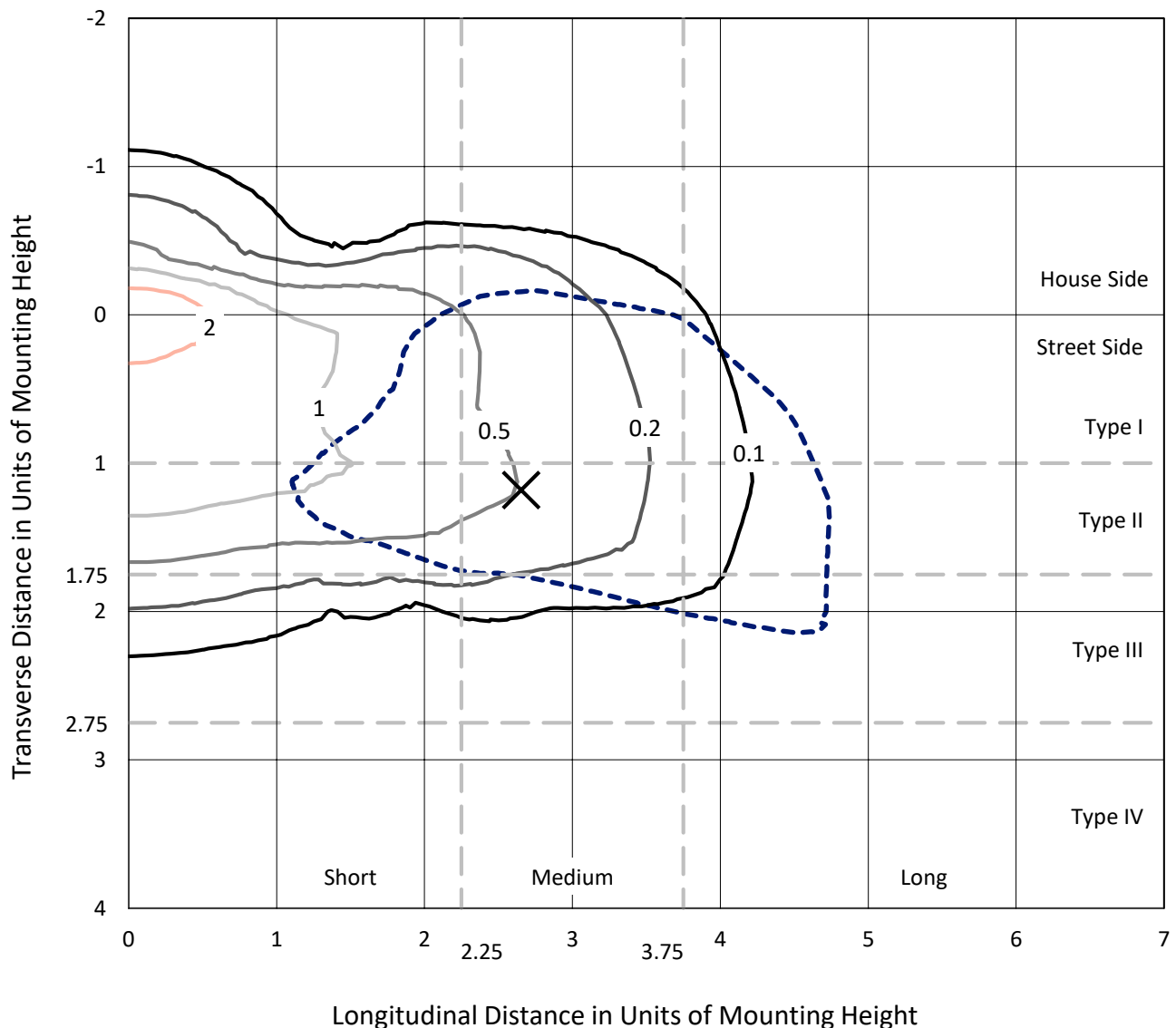


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## Iso-Footcandle Lines of Horizontal Illumination

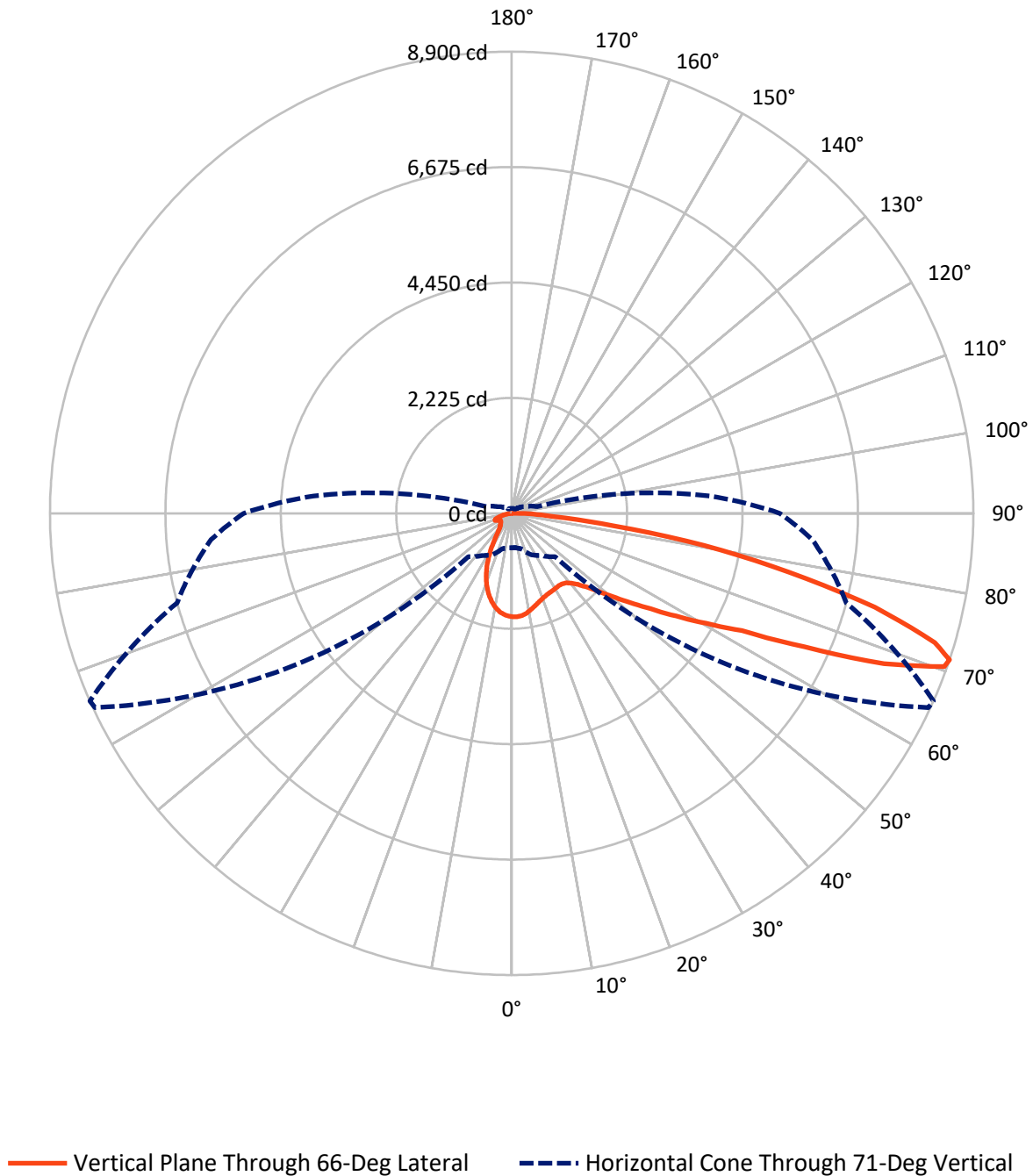
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 3.2 fc  
 Type III - Medium - N/A

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CATALOG NUMBER: GLEON-SA2A-735-U-SL2

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA2A-735-U-SL2

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1612.6   | 0.0    | 1612.6 |
|                    | % Fixture | 18.5     | 0.0    | 18.5   |
| <b>Street Side</b> | Lumens    | 7088.9   | 0.0    | 7088.9 |
|                    | % Fixture | 81.5     | 0.0    | 81.5   |
| <b>Total</b>       | Lumens    | 8701.6   | 0.0    | 8701.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 175.5  | 2.0       |
| 10°-20°   | 420.8  | 4.8       |
| 20°-30°   | 565.3  | 6.5       |
| 30°-40°   | 743.6  | 8.5       |
| 40°-50°   | 1081.8 | 12.4      |
| 50°-60°   | 1689.9 | 19.4      |
| 60°-70°   | 2116.8 | 24.3      |
| 70°-80°   | 1614.7 | 18.6      |
| 80°-90°   | 293.2  | 3.4       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 8701.6 | 100.0     |
| 0°-180°   | 8701.6 | 100.0     |

**Coefficient of Utilization**



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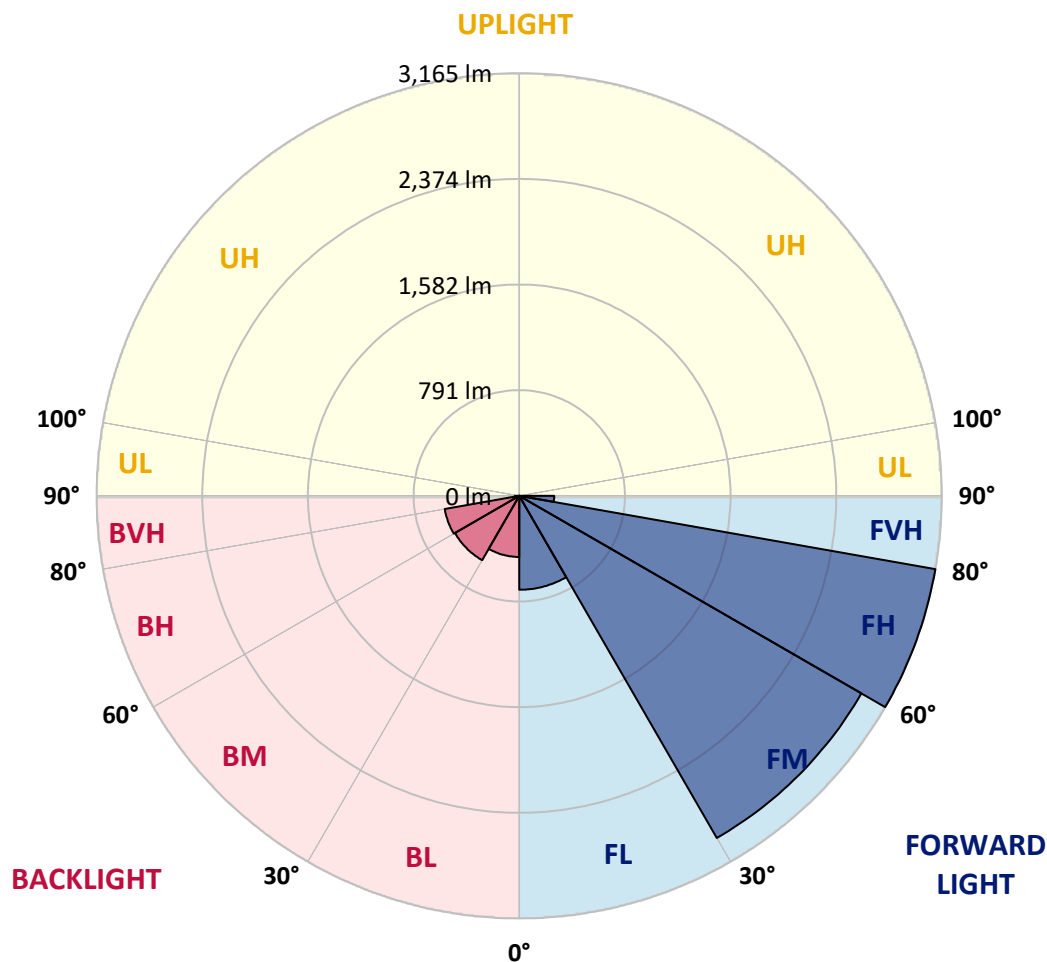
CATALOG NUMBER: GLEON-SA2A-735-U-SL2

**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 703.6  | 8.1       |                         |      |         |
| FM   | (30°-60°)   | 2959.0 | 34.0      |                         |      |         |
| FH   | (60°-80°)   | 3164.9 | 36.4      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 261.5  | 3.0       |                         |      | G3/500  |
| BL   | (0°-30°)    | 457.9  | 5.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 556.3  | 6.4       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 566.6  | 6.5       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 31.7   | 0.4       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G3**

Type III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 66°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 |
| 2.5°  | 1956.4 | 1953.4 | 1962.4 | 1971.7 | 1975.3 | 1981.3 | 1990.3 | 1995.5 | 1995.2 | 1996.0 | 1993.0 |
| 5°    | 1826.7 | 1822.8 | 1840.7 | 1855.5 | 1883.7 | 1915.5 | 1954.3 | 1982.0 | 1982.5 | 1998.2 | 2002.4 |
| 7.5°  | 1703.7 | 1701.0 | 1721.8 | 1745.5 | 1778.2 | 1827.0 | 1889.7 | 1949.2 | 1952.8 | 1995.2 | 2009.9 |
| 10°   | 1605.2 | 1604.6 | 1624.7 | 1650.6 | 1688.7 | 1743.1 | 1815.2 | 1902.3 | 1907.7 | 1980.7 | 2011.1 |
| 12.5° | 1528.3 | 1529.5 | 1546.9 | 1576.4 | 1616.6 | 1673.4 | 1751.5 | 1849.8 | 1858.4 | 1957.9 | 2004.2 |
| 15°   | 1471.5 | 1476.3 | 1490.5 | 1520.2 | 1559.9 | 1617.5 | 1697.7 | 1801.1 | 1814.3 | 1932.4 | 2000.3 |
| 17.5° | 1439.1 | 1444.5 | 1454.4 | 1479.0 | 1516.3 | 1571.9 | 1647.9 | 1761.1 | 1773.1 | 1912.8 | 2000.6 |
| 20°   | 1429.5 | 1433.9 | 1439.7 | 1454.7 | 1486.2 | 1536.7 | 1608.5 | 1725.0 | 1738.0 | 1897.2 | 2003.6 |
| 22.5° | 1448.4 | 1451.7 | 1452.3 | 1451.1 | 1470.4 | 1511.4 | 1580.0 | 1698.7 | 1712.5 | 1887.0 | 2005.7 |
| 25°   | 1489.0 | 1493.5 | 1490.1 | 1479.0 | 1472.7 | 1497.9 | 1565.3 | 1681.3 | 1695.0 | 1879.5 | 2001.4 |
| 27.5° | 1549.9 | 1550.6 | 1547.9 | 1533.4 | 1503.7 | 1499.4 | 1560.7 | 1671.0 | 1684.2 | 1870.8 | 1992.8 |
| 30°   | 1632.8 | 1636.7 | 1632.0 | 1612.4 | 1563.8 | 1523.5 | 1566.1 | 1661.0 | 1673.1 | 1859.6 | 1978.6 |
| 32.5° | 1729.9 | 1739.5 | 1739.2 | 1718.8 | 1649.0 | 1577.3 | 1588.4 | 1655.1 | 1664.4 | 1847.9 | 1961.6 |
| 35°   | 1830.5 | 1843.7 | 1868.4 | 1859.6 | 1773.5 | 1662.3 | 1631.0 | 1664.7 | 1671.0 | 1846.4 | 1949.5 |
| 37.5° | 1935.1 | 1948.3 | 1999.1 | 2022.5 | 1921.6 | 1784.0 | 1698.3 | 1698.7 | 1701.7 | 1864.8 | 1948.6 |
| 40°   | 2044.5 | 2058.5 | 2134.8 | 2195.8 | 2113.5 | 1938.1 | 1806.8 | 1769.6 | 1766.2 | 1909.9 | 1966.3 |
| 42.5° | 2197.6 | 2210.3 | 2301.9 | 2379.7 | 2326.5 | 2135.5 | 1956.7 | 1878.9 | 1871.9 | 1998.2 | 2023.1 |
| 45°   | 2391.5 | 2402.3 | 2499.6 | 2582.8 | 2555.5 | 2360.8 | 2145.1 | 2029.4 | 2028.3 | 2145.4 | 2138.2 |
| 47.5° | 2621.8 | 2630.3 | 2717.7 | 2798.2 | 2808.2 | 2620.1 | 2381.8 | 2261.6 | 2242.1 | 2347.3 | 2316.3 |
| 50°   | 2861.9 | 2871.2 | 2930.7 | 3017.3 | 3090.9 | 2967.1 | 2686.5 | 2546.2 | 2520.0 | 2613.7 | 2568.6 |
| 52.5° | 3020.8 | 3033.1 | 3084.8 | 3194.5 | 3408.7 | 3347.4 | 3046.7 | 2891.1 | 2851.4 | 2936.7 | 2902.1 |
| 55°   | 2949.9 | 2977.6 | 3056.6 | 3232.4 | 3662.8 | 3928.4 | 3491.0 | 3293.3 | 3248.6 | 3319.5 | 3299.1 |
| 57.5° | 2627.6 | 2665.4 | 2773.3 | 3044.6 | 3698.6 | 4440.4 | 4162.8 | 3767.1 | 3735.6 | 3715.1 | 3724.4 |
| 60°   | 2038.4 | 2074.7 | 2208.5 | 2562.1 | 3449.5 | 4814.1 | 5173.7 | 4351.2 | 4305.5 | 4112.3 | 4120.7 |
| 62.5° | 1442.7 | 1424.3 | 1516.0 | 1774.7 | 2803.0 | 4858.0 | 6324.1 | 5132.3 | 4982.1 | 4531.7 | 4494.7 |
| 65°   | 1100.2 | 1096.0 | 1137.1 | 1219.5 | 1697.7 | 4333.1 | 7009.3 | 6445.2 | 6210.5 | 5025.0 | 4937.9 |
| 67.5° | 904.0  | 896.5  | 937.0  | 1056.9 | 1093.3 | 2795.5 | 7024.4 | 7968.4 | 7737.9 | 5639.1 | 5450.4 |
| 70°   | 743.3  | 734.9  | 772.7  | 927.4  | 1010.4 | 1417.7 | 5911.9 | 8860.3 | 8848.0 | 6416.6 | 5837.4 |
| 71°   | 666.3  | 660.4  | 705.7  | 877.5  | 992.7  | 1181.6 | 5104.3 | 8862.7 | 8899.7 | 6679.8 | 5814.5 |
| 72.5° | 542.5  | 544.7  | 592.7  | 781.1  | 979.4  | 1043.4 | 3751.5 | 8449.6 | 8527.8 | 6930.6 | 5607.0 |
| 75°   | 360.5  | 362.3  | 425.4  | 600.8  | 949.6  | 1020.9 | 2061.9 | 7090.2 | 7233.8 | 6780.5 | 5116.3 |
| 77.5° | 242.1  | 241.6  | 284.5  | 412.2  | 827.4  | 1020.9 | 1209.0 | 5302.9 | 5460.6 | 5395.2 | 3944.4 |
| 80°   | 166.7  | 165.5  | 195.9  | 284.5  | 626.4  | 1033.2 | 934.6  | 3716.3 | 3764.1 | 2913.6 | 1603.1 |
| 82.5° | 102.2  | 103.0  | 128.0  | 201.0  | 426.3  | 929.9  | 882.4  | 2026.4 | 1974.4 | 817.2  | 400.5  |
| 85°   | 58.6   | 58.3   | 81.7   | 136.1  | 273.7  | 784.7  | 860.5  | 872.1  | 800.0  | 246.0  | 144.8  |
| 87.5° | 21.1   | 22.5   | 43.9   | 75.4   | 156.8  | 546.4  | 730.1  | 453.7  | 408.9  | 111.1  | 65.5   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 | 1993.3 |
| 2.5°  | 1991.0 | 1992.8 | 1990.6 | 1978.6 | 1968.5 | 1951.9 | 1942.6 | 1929.7 | 1925.8 | 1923.9 | 1928.8 |
| 5°    | 1998.4 | 1999.1 | 1981.3 | 1949.8 | 1914.3 | 1872.6 | 1842.5 | 1805.6 | 1788.2 | 1780.7 | 1785.5 |
| 7.5°  | 2005.3 | 2002.6 | 1963.9 | 1903.5 | 1838.0 | 1765.4 | 1700.7 | 1641.6 | 1607.0 | 1592.9 | 1594.1 |
| 10°   | 2006.3 | 1994.9 | 1932.7 | 1839.2 | 1737.7 | 1631.0 | 1531.9 | 1440.5 | 1382.9 | 1345.3 | 1356.7 |
| 12.5° | 1997.0 | 1977.8 | 1886.8 | 1756.1 | 1615.1 | 1469.7 | 1335.7 | 1198.7 | 1116.4 | 1078.3 | 1079.5 |
| 15°   | 1989.8 | 1954.9 | 1830.2 | 1658.1 | 1468.8 | 1276.2 | 1093.3 | 932.2  | 844.5  | 805.4  | 787.2  |
| 17.5° | 1983.7 | 1930.3 | 1764.7 | 1547.9 | 1296.1 | 1051.8 | 831.9  | 688.3  | 640.3  | 628.8  | 624.0  |
| 20°   | 1975.3 | 1904.2 | 1691.7 | 1420.1 | 1099.3 | 800.7  | 607.5  | 536.6  | 536.9  | 550.1  | 551.8  |
| 22.5° | 1963.6 | 1874.4 | 1613.9 | 1276.9 | 888.0  | 583.1  | 476.2  | 455.7  | 476.5  | 501.7  | 506.2  |
| 25°   | 1946.2 | 1839.2 | 1527.4 | 1118.5 | 677.1  | 448.3  | 406.8  | 405.9  | 431.1  | 457.6  | 461.5  |
| 27.5° | 1921.6 | 1793.3 | 1431.2 | 948.5  | 499.0  | 380.9  | 364.4  | 370.8  | 389.4  | 408.6  | 410.1  |
| 30°   | 1888.5 | 1739.8 | 1325.2 | 769.1  | 391.2  | 339.2  | 337.4  | 343.1  | 354.5  | 368.1  | 369.3  |
| 32.5° | 1852.2 | 1685.4 | 1211.9 | 595.4  | 335.0  | 316.6  | 318.5  | 321.2  | 326.6  | 332.0  | 333.2  |
| 35°   | 1819.1 | 1629.8 | 1096.0 | 452.5  | 308.2  | 301.9  | 300.7  | 300.1  | 300.7  | 298.9  | 299.2  |
| 37.5° | 1797.8 | 1583.9 | 975.2  | 360.2  | 292.9  | 289.1  | 285.4  | 280.9  | 275.8  | 272.8  | 273.4  |
| 40°   | 1790.0 | 1549.6 | 852.9  | 311.2  | 280.3  | 277.6  | 270.7  | 261.1  | 255.1  | 253.3  | 253.3  |
| 42.5° | 1811.0 | 1531.9 | 734.9  | 286.6  | 269.8  | 265.3  | 253.8  | 242.8  | 238.2  | 237.9  | 237.6  |
| 45°   | 1875.3 | 1539.1 | 622.5  | 273.1  | 260.2  | 251.4  | 236.4  | 227.1  | 224.1  | 224.7  | 224.4  |
| 47.5° | 1990.6 | 1584.5 | 526.3  | 264.1  | 250.6  | 239.1  | 222.4  | 214.8  | 211.2  | 211.2  | 211.5  |
| 50°   | 2186.8 | 1690.6 | 449.8  | 256.5  | 242.5  | 227.8  | 212.1  | 202.8  | 198.0  | 197.7  | 197.7  |
| 52.5° | 2472.5 | 1880.4 | 402.0  | 250.2  | 233.4  | 217.5  | 201.9  | 190.1  | 184.4  | 183.2  | 182.7  |
| 55°   | 2830.7 | 2152.6 | 388.7  | 246.0  | 221.4  | 206.4  | 189.6  | 177.8  | 171.6  | 168.8  | 168.5  |
| 57.5° | 3231.2 | 2483.7 | 414.9  | 241.0  | 209.1  | 193.2  | 176.1  | 165.0  | 158.4  | 155.0  | 154.7  |
| 60°   | 3636.4 | 2845.1 | 521.6  | 233.7  | 198.9  | 178.8  | 162.3  | 152.0  | 145.4  | 141.8  | 141.2  |
| 62.5° | 4042.3 | 3226.0 | 739.4  | 233.2  | 191.7  | 165.0  | 148.1  | 139.4  | 133.1  | 129.2  | 128.3  |
| 65°   | 4500.2 | 3643.0 | 986.9  | 249.1  | 189.3  | 152.3  | 133.7  | 126.8  | 121.4  | 117.7  | 117.5  |
| 67.5° | 5025.9 | 4113.8 | 963.2  | 281.8  | 197.4  | 140.9  | 120.2  | 114.8  | 110.9  | 107.9  | 107.6  |
| 70°   | 5272.6 | 4040.2 | 598.8  | 304.9  | 208.8  | 129.8  | 107.2  | 103.3  | 100.3  | 98.3   | 97.3   |
| 71°   | 5169.3 | 3836.2 | 502.0  | 302.2  | 207.6  | 125.0  | 102.2  | 99.1   | 96.1   | 94.4   | 93.4   |
| 72.5° | 4887.5 | 3498.5 | 418.8  | 281.2  | 194.0  | 116.3  | 95.6   | 92.5   | 89.8   | 87.8   | 87.1   |
| 75°   | 4385.7 | 3124.5 | 335.3  | 224.7  | 154.7  | 98.3   | 83.8   | 80.5   | 78.4   | 77.2   | 76.0   |
| 77.5° | 3223.9 | 2229.8 | 259.2  | 177.6  | 113.8  | 80.2   | 71.5   | 69.1   | 67.0   | 65.2   | 64.3   |
| 80°   | 1235.0 | 863.7  | 174.6  | 132.5  | 83.6   | 63.3   | 57.7   | 56.5   | 54.4   | 53.2   | 53.2   |
| 82.5° | 332.6  | 258.0  | 93.2   | 80.2   | 55.9   | 46.3   | 44.2   | 43.6   | 41.7   | 39.3   | 39.7   |
| 85°   | 134.6  | 113.8  | 52.3   | 44.2   | 34.3   | 27.3   | 29.7   | 30.1   | 27.9   | 25.0   | 25.2   |
| 87.5° | 59.2   | 48.3   | 29.2   | 19.6   | 15.0   | 10.5   | 13.5   | 13.5   | 12.3   | 10.2   | 9.3    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

All Brands

Data applicable to all product families using SA light engines

Report Number: SP1-2101-121-7

Luminaire Tested: IFLD-S-SA2A-735-U-T2

Test Date: 03/04/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-7  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-735-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3388   | CRI (Ra): | 73.1 |      |       |
| CIE u':                   | 0.2371 | R1:       | 68.9 | R9:  | -34.6 |
| CIE v':                   | 0.5177 | R2:       | 81.1 | R10: | 57.8  |
| Duv:                      | 0.0032 | R3:       | 93.1 | R11: | 68.6  |
| CIE x:                    | 0.4153 | R4:       | 71.6 | R12: | 53.9  |
| CIE y:                    | 0.4030 | R5:       | 69.4 | R13: | 70.9  |
| CIE z:                    | 0.1817 | R6:       | 75.0 | R14: | 96.2  |
| Peak Wavelength (nm):     | 590    | R7:       | 79.5 |      |       |
| Dominant Wavelength (nm): | 580    | R8:       | 46.4 |      |       |
| Purity:                   | 45.7   |           |      |      |       |
| Rf:                       | 76.9   |           |      |      |       |
| Rg:                       | 94.4   |           |      |      |       |



### Test Conditions

Stabilization Time: 81M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/30%  
 Sphere Temperature (°C): 24.1

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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**CIE 1931 Chromaticity Diagram**



**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3500K 4-step quadrangle

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### Photopic Flux vs. Wavelength



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2672             | 0.0              | 490       | 34553            | 4.9              | 620       | 136720           | 35.6             | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 8.0              | 625       | 126308           | 27.9             | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 12.1             | 630       | 114625           | 20.7             | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 18.1             | 635       | 103216           | 15.5             | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 25.4             | 640       | 92605            | 11.1             | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 33.9             | 645       | 83234            | 8.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 43.0             | 650       | 73263            | 5.4              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 50.1             | 655       | 64627            | 3.7              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 57.9             | 660       | 56614            | 2.4              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 64.0             | 665       | 49537            | 1.6              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.0              | 540       | 107316           | 69.9             | 670       | 42866            | 0.9              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.0              | 545       | 113101           | 75.3             | 675       | 36708            | 0.6              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 0.0              | 550       | 120690           | 82.0             | 680       | 31814            | 0.4              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 0.1              | 555       | 128583           | 87.8             | 685       | 27485            | 0.2              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 0.3              | 560       | 137796           | 93.6             | 690       | 23698            | 0.1              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 0.8              | 565       | 146577           | 97.5             | 695       | 20309            | 0.1              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 1.6              | 570       | 154581           | 100.5            | 700       | 17890            | 0.1              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 2.4              | 575       | 162633           | 101.2            | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 2.5              | 580       | 168101           | 99.9             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 2.1              | 585       | 173145           | 96.2             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 1.8              | 590       | 174675           | 90.3             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 1.7              | 595       | 173724           | 82.3             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 1.5              | 600       | 171241           | 73.8             | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 1.7              | 605       | 165134           | 64.0             | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 2.2              | 610       | 156652           | 53.8             | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 3.3              | 615       | 147879           | 44.6             | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength


**Scotopic Lumens: 12126**
**S/P: 1.36**

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 360               | 2672                          | 0.0                            | 490               | 34553                         | 53.2                           | 620               | 136720                        | 1.7                            | 750               | 5870                          | 0.0                            | 880               | 4216                          | 0.0                            |
| 365               | 2252                          | 0.0                            | 495               | 44336                         | 71.7                           | 625               | 126308                        | 1.1                            | 755               | 5421                          | 0.0                            | 885               | 4132                          | 0.0                            |
| 370               | 2217                          | 0.0                            | 500               | 54643                         | 91.4                           | 630               | 114625                        | 0.6                            | 760               | 5097                          | 0.0                            | 890               | 3992                          | 0.0                            |
| 375               | 2697                          | 0.0                            | 505               | 64676                         | 110.0                          | 635               | 103216                        | 0.4                            | 765               | 4626                          | 0.0                            | 895               | 3214                          | 0.0                            |
| 380               | 3039                          | 0.0                            | 510               | 73825                         | 125.1                          | 640               | 92605                         | 0.2                            | 770               | 3782                          | 0.0                            | 900               | 2580                          | 0.0                            |
| 385               | 2655                          | 0.0                            | 515               | 81872                         | 135.7                          | 645               | 83234                         | 0.1                            | 775               | 3506                          | 0.0                            | 905               | 1776                          | 0.0                            |
| 390               | 2357                          | 0.0                            | 520               | 88574                         | 140.8                          | 650               | 73263                         | 0.1                            | 780               | 3507                          | 0.0                            | 910               | 3995                          | 0.0                            |
| 395               | 2186                          | 0.0                            | 525               | 93289                         | 139.6                          | 655               | 64627                         | 0.1                            | 785               | 3267                          | 0.0                            | 915               | 4288                          | 0.0                            |
| 400               | 2015                          | 0.0                            | 530               | 98393                         | 135.7                          | 660               | 56614                         | 0.0                            | 790               | 2849                          | 0.0                            | 920               | 2446                          | 0.0                            |
| 405               | 2234                          | 0.1                            | 535               | 103269                        | 128.7                          | 665               | 49537                         | 0.0                            | 795               | 3037                          | 0.0                            | 925               | 3009                          | 0.0                            |
| 410               | 3412                          | 0.2                            | 540               | 107316                        | 118.6                          | 670               | 42866                         | 0.0                            | 800               | 2716                          | 0.0                            | 930               | 3026                          | 0.0                            |
| 415               | 6135                          | 0.6                            | 545               | 113101                        | 108.4                          | 675               | 36708                         | 0.0                            | 805               | 2648                          | 0.0                            | 935               | 4734                          | 0.0                            |
| 420               | 12146                         | 2.0                            | 550               | 120690                        | 98.7                           | 680               | 31814                         | 0.0                            | 810               | 3187                          | 0.0                            | 940               | 3719                          | 0.0                            |
| 425               | 23983                         | 5.9                            | 555               | 128583                        | 87.9                           | 685               | 27485                         | 0.0                            | 815               | 2931                          | 0.0                            | 945               | 1480                          | 0.0                            |
| 430               | 42142                         | 14.3                           | 560               | 137796                        | 77.0                           | 690               | 23698                         | 0.0                            | 820               | 2717                          | 0.0                            | 950               | 3450                          | 0.0                            |
| 435               | 68228                         | 30.5                           | 565               | 146577                        | 65.8                           | 695               | 20309                         | 0.0                            | 825               | 2236                          | 0.0                            | 955               | 5051                          | 0.0                            |
| 440               | 99323                         | 55.5                           | 570               | 154581                        | 54.6                           | 700               | 17890                         | 0.0                            | 830               | 2628                          | 0.0                            | 960               | 3176                          | 0.0                            |
| 445               | 115584                        | 77.4                           | 575               | 162633                        | 44.3                           | 705               | 15500                         | 0.0                            | 835               | 3140                          | 0.0                            | 965               | 5178                          | 0.0                            |
| 450               | 94997                         | 73.6                           | 580               | 168101                        | 34.6                           | 710               | 13699                         | 0.0                            | 840               | 3675                          | 0.0                            | 970               | 6385                          | 0.0                            |
| 455               | 61433                         | 53.7                           | 585               | 173145                        | 26.5                           | 715               | 12398                         | 0.0                            | 845               | 3283                          | 0.0                            | 975               | 3810                          | 0.0                            |
| 460               | 43373                         | 41.9                           | 590               | 174675                        | 19.5                           | 720               | 11147                         | 0.0                            | 850               | 3055                          | 0.0                            | 980               | 4322                          | 0.0                            |
| 465               | 32472                         | 34.3                           | 595               | 173724                        | 13.9                           | 725               | 9761                          | 0.0                            | 855               | 2932                          | 0.0                            | 985               | 4200                          | 0.0                            |
| 470               | 24257                         | 27.9                           | 600               | 171241                        | 9.7                            | 730               | 8651                          | 0.0                            | 860               | 3382                          | 0.0                            | 990               | 4661                          | 0.0                            |
| 475               | 21690                         | 27.1                           | 605               | 165134                        | 6.5                            | 735               | 7730                          | 0.0                            | 865               | 2605                          | 0.0                            | 995               | 6746                          | 0.0                            |
| 480               | 23173                         | 31.3                           | 610               | 156652                        | 4.2                            | 740               | 6847                          | 0.0                            | 870               | 3325                          | 0.0                            | 1000              | 4150                          | 0.0                            |
| 485               | 27564                         | 40.0                           | 615               | 147879                        | 2.7                            | 745               | 6124                          | 0.0                            | 875               | 3325                          | 0.0                            |                   |                               |                                |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: 4490.7

M/P: 0.5

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2672             | 0.0              | 490       | 34553            | 28.8             | 620       | 136720           | 0.1              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 36.6             | 625       | 126308           | 0.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 43.9             | 630       | 114625           | 0.0              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 49.6             | 635       | 103216           | 0.0              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 53.0             | 640       | 92605            | 0.0              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 53.5             | 645       | 83234            | 0.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 51.6             | 650       | 73263            | 0.0              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 47.3             | 655       | 64627            | 0.0              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 42.5             | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 37.2             | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.1              | 540       | 107316           | 31.4             | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.4              | 545       | 113101           | 26.3             | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 1.4              | 550       | 120690           | 21.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 3.7              | 555       | 128583           | 17.3             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 8.9              | 560       | 137796           | 13.6             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 18.2             | 565       | 146577           | 10.3             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 33.2             | 570       | 154581           | 7.6              | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 45.6             | 575       | 162633           | 5.4              | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 43.8             | 580       | 168101           | 3.8              | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 32.2             | 585       | 173145           | 2.6              | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 25.6             | 590       | 174675           | 1.7              | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 21.2             | 595       | 173724           | 1.1              | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 17.4             | 600       | 171241           | 0.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 16.6             | 605       | 165134           | 0.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 18.6             | 610       | 156652           | 0.3              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 22.7             | 615       | 147879           | 0.2              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 76.9$   
 $R_g = 94.4$   
 CIE  $R_a = 73.1$   
 $R_g = -34.6$

### Spectral Power Distribution Comparison



### Color Vector Graphics



**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 88 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 84 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 75 | CES81 = 75 |
| CES07 = 40 | CES32 = 67 | CES57 = 74 | CES82 = 94 |
| CES08 = 39 | CES33 = 74 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 78 | CES59 = 87 | CES84 = 89 |
| CES10 = 75 | CES35 = 89 | CES60 = 93 | CES85 = 80 |
| CES11 = 58 | CES36 = 98 | CES61 = 86 | CES86 = 66 |
| CES12 = 64 | CES37 = 86 | CES62 = 89 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 68 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 88 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 82 | CES94 = 52 |
| CES20 = 65 | CES45 = 87 | CES70 = 67 | CES95 = 69 |
| CES21 = 86 | CES46 = 82 | CES71 = 66 | CES96 = 78 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 59 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 88 | CES75 = 66 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)